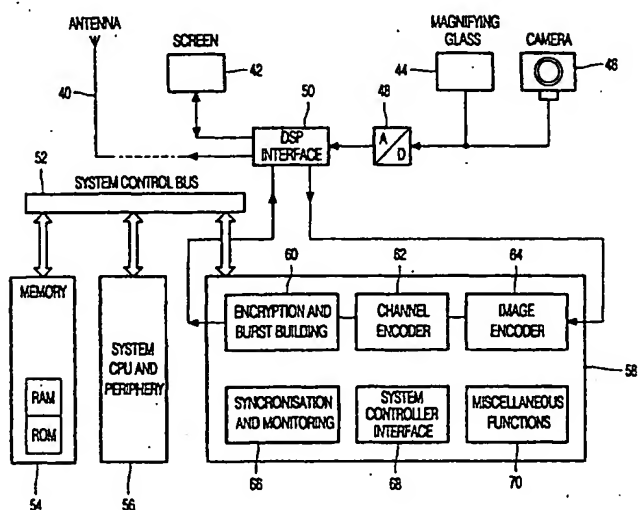




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(54) Title: A DIGITAL HANDHELD KEYBOARD ORIENTED DEVICE WITH MULTIKEY DATA AND CONTROL INPUT, DISPLAY, WIRELESS COMMUNICATION AND DATA PROCESSING, AND A CAMERA FEEDING THE COMMUNICATION



(57) Abstract

A digital keyboard-oriented device has an interconnected arrangement of multikey data and control input means, a display, communication facilities, data processing elements and a camera that may be controlled to feed the said communication facilities. In particular, the device is handheld, the camera is provided with optical output elements for delimiting a short range image capturing area through one or more visual indicators, and the communication facilities are wireless.

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A digital handheld keyboard oriented device with multikey data and control input, display, wireless communication and data processing, and a camera feeding the communication

BACKGROUND OF THE INVENTION

The invention relates to a device as recited in the preamble of Claim 1. German Offenlegungsschrift 36 13 585 A1 discloses a subscriber device for use with video telephony, and in particular, its mechanical setup for optimum use in **bidirectional** communication. Such a device will communicate voice as well as images of object like drawings. Advancing digital technology allows for miniaturization of such and similar devices. However, the known device would not lend itself to such miniaturization through the intrinsic necessity for a bulky frame structure.

SUMMARY TO THE INVENTION

In consequence, amongst other things, it is an object of the present invention to exchange the fixed and heavy structure of the known device for a flexible and easy to use arrangement for exactly indicating an exact target field to a human user, whilst keeping the user interface as friendly as possible.

Now therefore, according to one of its aspects the invention is characterized according to the characterizing part of Claim 1. The primary function of the device may be an organizer that stores multiple data items that may now be accompanied by pictures, or a communication device, such as a mobile telephone that may now include a lightweight and easy-to-use facsimile apparatus. Further advantageous aspects of the invention are recited in dependent Claims. Generally, the inventor has recognized that it is more useful to have the camera in the device than to need a separate fax machine or similar camera driven device. In particular, the mechanism may be integrated into future devices thereby permitting real-time exchanging of information between users. Finally, also Internet exchange connections may profit through the use of **HTML** language.

BRIEF DESCRIPTION OF THE DRAWING

These and further aspects and advantages of the invention will be discussed more in detail hereinafter with reference to the disclosure of preferred embodiments, and in particular with reference to the appended Figures that show:

Figure 1, the front cover of a mobile phone according to the invention;

Figure 2, the rear cover of the same apparatus;

Figure 3, a block diagram of a device according to the invention;

Figure 4, an image of the device's footprint in operation.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 shows the front cover of a mobile phone according to the invention. Since mobile
5 phones have been in general use for some time now, the telephone functions thereof do not
warrant specific disclosure herein. Both the control by a keyboard and the transfer of information
may be digital. Combination of such device with a fax mechanism would conventionally require
a separately housed mechanical scanner to acquire the image, and also a physical communication
layer permitting to transmit the image data between the handset and a computer. In fact, a much
10 less convenient procedure would be as follows:
acquire the image by use of a scanner and storing on a computer hard disk;
connecting the handset to the computer;
transmitting the image by software installed on the handset.

It would be clear that such is a complex procedure. The present invention obviates
15 the need for these complications. In Figure 1, housing 20 is of more or less conventional
dimensions. It carries twelve conventional telephone control keys 22 and four special function
keys 30. The latter keys may inter alia control switchover between telephone and fax
functionalities, and set the image sensitivity level. In another environment, the keys may include
alphabetic keys to enter text elements, or even a more or less complete alphanumerical keyboard.
20 There are further shown an antenna 24, a display screen 26 and a magnifying glass 28. The
antenna allows for wireless communication over an appropriate range. The camera is positioned
at the rear side, cf. Figure 2, and a small image, either as capture or taken from memory is
displayed on screen 26. Magnifying glass 28 as terminal part of an optical channel allows an
immediate view of what the camera should effectively "see". Comparing images 26 and 28
25 would teach a user whether the captured image quality is sufficient to warrant further processing
thereof. Another usage of the magnifying glass is to check whether the image is alright and
storing the image only when a validizing key has been actuated.

Figure 2 shows the rear cover of a mobile phone according to the invention. The
Figure shows housing 20 and antenna 24, and further mini-camera 32 and the optical objective 34
30 of the magnifying glass 28 in Figure 1. Alternatively, the magnifying glass may be based on the
same objective as the camera, cf. Figure 3. The axis direction and the focus of the camera are
adjusted by an appropriate button not specifically indicated. The effective range may vary
between 10-20 centimeters for small-sheet fax applications and 1-2 meters for flipovers and
similar media.

Figure 3 is a block diagram of the data processing setup of a device according to the invention. Camera 46 has been shown as a self-supporting subsystem that comprises all necessary electronics for executing the scan feature. Magnifying glass 44 receives the unprocessed image for immediate user inspection. Item 48 converts the analog camera signal to digitized samples. Item 50 forms the interface between the DSP core and the top row of peripherals 40-46. Of these, antenna 40 allows bidirectional communication between the device shown and a further station, such as a base station. Screen 42 displays a digitized image of the analog scene as captured. Central processing is effected by DSP core 58 that comprises various application software modules, to wit image encoder 64, channel encoder 62, and encryption and burst building 60. These three operate in succession to convert a digitized image to a data stream that is optimized for wireless transfer via antenna 40, such as according to the MPEG4 or GIF format. Further system software modules are item 66 for synchronizing and monitoring, item 68 effecting the interface to the system controller, and item 70 for implementing various miscellaneous functions. Examples of such miscellaneous functions are the filtering of white noise, image segmentation and contour detection, and other image enhancement functions that by themselves do not constitute part of the invention. The DSP furthermore interfaces to the general system control and data bus 52. This also interfaces to memory facility 54 that comprises RAM and ROM as shown, and finally to item 56 that symbolizes system CPU and further periphery not shown here.

Actuating the validizing key produces an interrupt call to the CPU 56. A resident ROM program is thereupon activated for effecting the following functionalities: Display a selection menu that allows to activate one of the following: send a still image to an end user fax machine, send an animated image to an end user mobile phone or computer that has an internet connection, save the still or animated image on a hard disc, such as through a connection with a computer, whilst also allowing to select image resolution and sound mixing for animated images.

Sampling the twodimensional image according to choice.

In each case, the image is displayed on the screen, whose size as indicated may or may not be larger than the magnifying glass.

Figure 4 is a perspective view of the device's footprint in operation. The camera viewing field is delimited by an arrangement of laser lighting elements that in this case form a continuous lighted line in a rectangular shape around the field of the image that may be captured. Forming a line display may be effected by elongated lighting elements. Concentrating the light energy on a narrow strip can be effected by a linear lens in front of and along the elongated laser.

Alternatively, an astigmatic lens in front of a point-shaped laser may produce an elongated image of the laser in question. Lowering of energy consumption may be effected by adopting an interrupted line image instead of continuous lines; for further lowering of energy consumption, the lasers are powered in a time-multiplex organization. Alternatively, the border of the field may
5 be indicated by a sequence of small dots, such as eight for each edge. In the extreme the dots may number only a single one for each corner, with, or without an imaging lens. Of course, other field shapes than rectangles are feasible.

Now, although the above has been detailed in particular with respect to application in a mobile telephony device, various alternative usages would be feasible. In the first place, the
10 speech channel is not a must, so that communication could be broader: it could be expanded to image and data, or image transfer could be combined with both voice and data transfer in a single device. Further, the invention could be applied in an organizer or similar device, for which the principal function is data storage, but which may be combined with image transfer. Such
15 organizers by themselves are in wide use, for managing appointments, address files and further personal files, and for a host of items that usually are of limited size only. In such case, the image transferred may be supplemented by an appropriate item from one of the databases stored.

CLAIMS:

1. A digital keyboard-oriented device comprising an interconnected arrangement of multikey data and control input means, display means, communication means, data processing means, and camera means switchable to feed said communication means,
characterized in that said device is handheld, said camera means are provided with
5 optical output means for delimiting a short range image capturing area through one or more visual indicators, and said communication means are wireless.
2. A device as claimed in Claim 1 and having the primary function of an organizer.
- 10 3. A device as claimed in Claim 1, and having the primary function of a communication device.
4. A device as claimed in Claim 3, and having the primary function of a mobile telephone.
- 15 5. A device as claimed in Claim 1, wherein said communication means are arranged for effecting a facsimile transfer.
6. A device as claimed in Claim 1, wherein said visual indicators comprise a line
20 pattern.
7. A device as claimed in Claim 1, wherein said visual indicators comprise a dot pattern.
- 25 8. A device as claimed in Claim 1, and having said camera means at an opposite side with respect to its principal multikey means.

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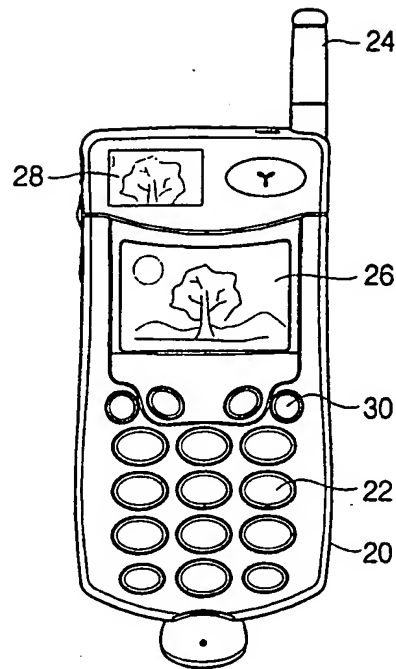


FIG. 1

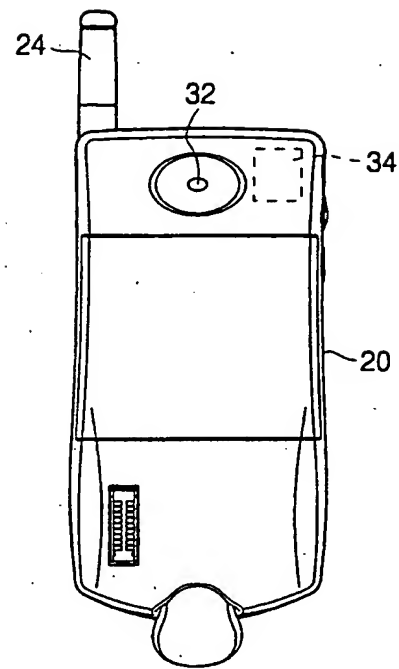


FIG. 2

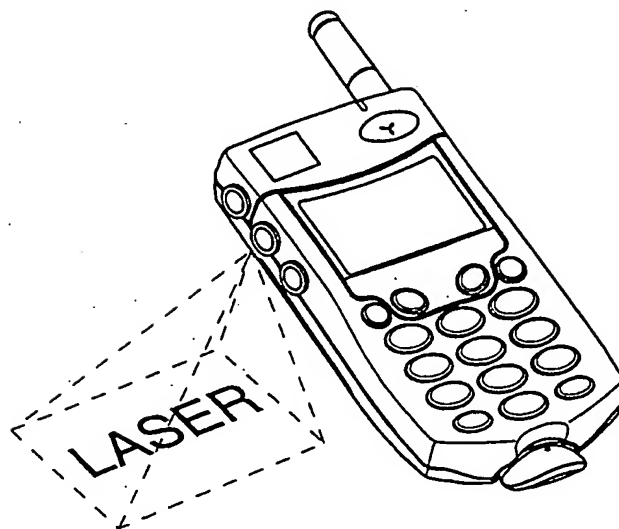


FIG. 4

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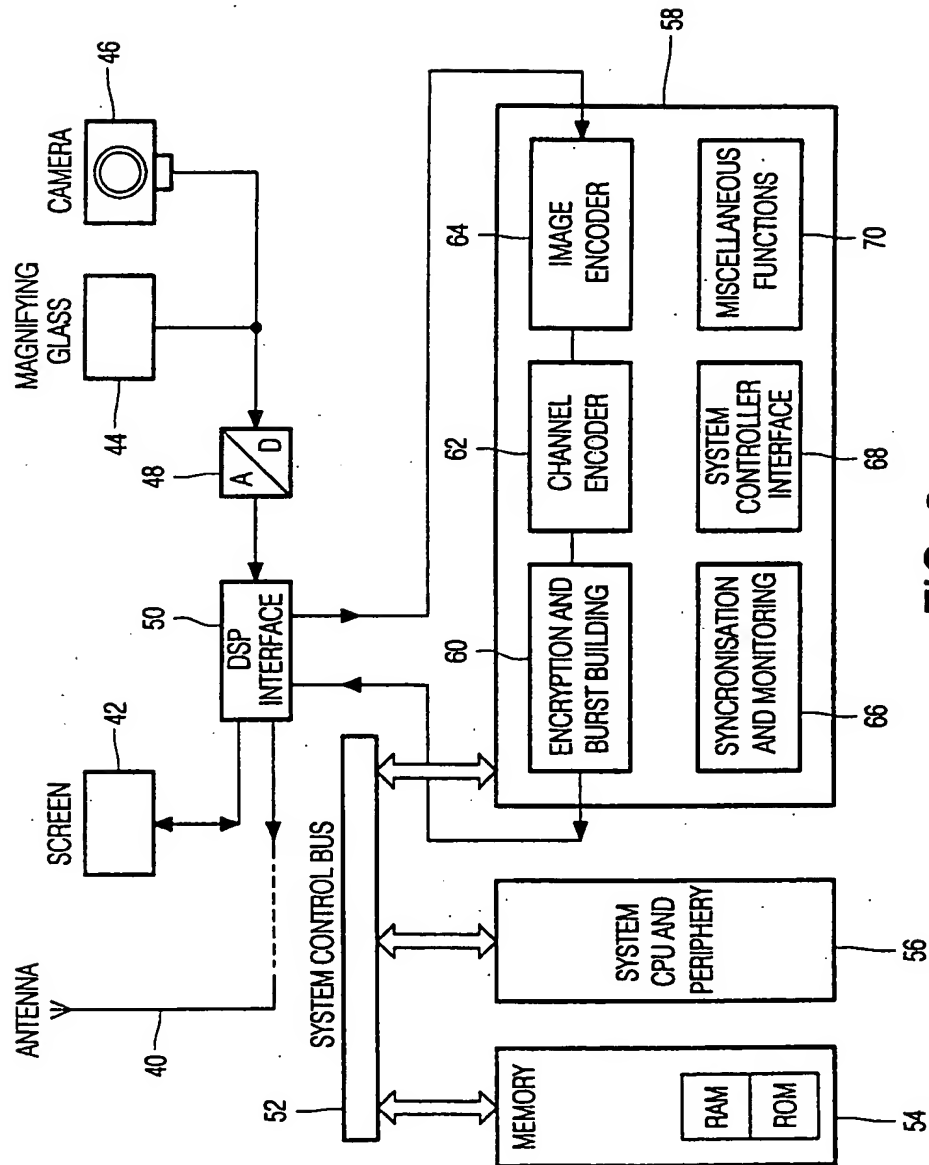


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No

EP 99/05037

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04N1/00 H04M1/72 G03B17/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M G03B H04N G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 195 28 424 A (SIEMENS AG) 21 November 1996 (1996-11-21)	1-4,6
A	column 1, line 29 - line 59 column 2, line 8 - line 39 column 3, line 22 - column 5, line 6 figures 1,2	8
Y	US 5 500 702 A (MEYERS) 19 March 1996 (1996-03-19)	1-4,6
A	abstract column 1, line 52 - line 62 column 2, line 30 - line 65 column 4, line 14 - column 5, line 9 figures 1,7,8	7
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

18 November 1999

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 97 26744 A (ROBB) 24 July 1997 (1997-07-24) abstract page 1, line 1 -page 2, line 26 page 5, line 7 -page 6, line 17 page 9, line 10 -page 10, line 8 page 18, line 9 - line 28 figures 1A,3,6 ----	1,3-5,8
A	EP 0 837 590 A (MATSUSHITA ELECTRIC IND CO LTD) 22 April 1998 (1998-04-22) abstract column 1, line 45 - line 60 column 2, line 1 - line 50 figure 1 ----	1,5
A	EP 0 833 494 A (CANON KK) 1 April 1998 (1998-04-01) column 1, line 58 -column 2, line 7 column 4, line 8 - line 58 column 12, line 57 -column 16, line 11 figures 1,14-17 -----	1,3,4,8

INTERNATIONAL SEARCH REPORT

Information on patent family members

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